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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,321	05/14/2001	Tuomo Suntola	ASMMC.013C2	9994

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EXAMINER

FULLER, ERIC B

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 07/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/855,321

Applicant(s)

SUNTOLA ET AL.

Examiner

Eric B. Fuller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2005.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-21 and 23-45 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 17-21 and 23-45 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 1.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 18, 2005 has been entered.

Response to Arguments

Applicant argues that the limitation of removing the reactant from the walls of the chamber, as added by amendment, overcomes the prior art of the previous Office Action. This has been found persuasive and the rejections of the previous Office Action have been withdrawn accordingly. Applicant's arguments are moot in view of the new grounds of rejection that follow.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 17-25 and 32-43 rejected under 35 U.S.C. 102(b) as being anticipated by Kitahara et al. (US 5,300,186).

Kitahara teaches an atomic layer epitaxy process in a vacuum with a steady pressure of 20 Torr (column 4, lines 45-50). Between reaction pulses, the reactant gases and "any residual component species remaining after the deposition" is purged from the reactor by introducing hydrogen for about three seconds (column 4, lines 60-68). This reads on removing the reactant from the walls of the reactor. The minimum flow rate of hydrogen taught is 2 SLM (standard liters per minute) and according to figure 3 much more than this is used during the purging steps. At a pressure of 20 Torr, which is very small compared to 760 Torrs of standard conditions, a very little amount of gas is required to fill a very large amount of volume, as pressure and volume are inversely proportional according to gas laws. Therefore, even though the volume of the chamber is not explicitly taught, it is the position of the examiner that the flow rates and flow times explicitly taught read on moving multiple reaction space volumes of inactive gas through the reaction space for any reasonably sized reactor used for coating silicon wafers.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 17-21, 23-25 and 32-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitahara et al. (US 5,300,186).

Kitahara teaches the limitations above. In the event the applicant disagrees with the Examiners assessment of the flow rate inherently filling multiple reaction space volumes, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to determine the volume of gas required to maximally remove the reactant gas and any residual component species remaining. By doing so, one would reduce contamination. Determining this amount would have been within the skill of one practicing in the art, through routine experimentation.

Claims 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitahara et al. (US 5,300,186), as applied to claim 17 above, and further in view of Moore, Sr. (US 3,662,583).

Kitahara teaches the limitations to claim 17, but is silent to the use of oblong feed pipes. However, Moore teaches that using oblong feed types for feed a process space provides a wider spread of feed gas, such that the process space may be reduced. One of skill in the art would recognize that a smaller process space would result in less feed gas required and/or more efficient purging. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize oblong feed pipes in the process Kitahara. By doing so, the volume of the process

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chamber may be reduced, resulting in less feed gas required and more efficient purging (i.e. more require space volumes of purge gas being flowed through the reactor).

Conclusion

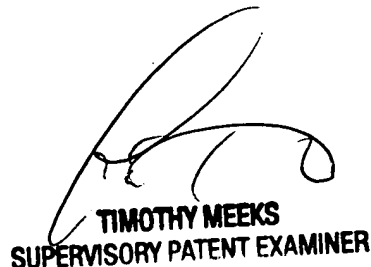
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B. Fuller whose telephone number is (571) 272-1420. The examiner can normally be reached on Mondays through Thursdays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks, can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



EBF



TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER